ABSTRACT OF THE DISCLOSURE

The present invention applies a technique, which is characteristic of color images, to embed a digital watermark in a color image and decode the embedded digital watermark. The technique adjusts a color signal transformation matrix by adding or subtracting a digital watermark matrix to or from the color signal transformation matrix in the process of transforming image data of an original color image in an RGB colorimetric system into image data in a YCbCr colorimetric system with the color signal transformation matrix. The digital watermark matrix includes an arbitrary numerical value of real number x, which represents digital watermark information, as an entry thereof and satisfies a condition that a sum of respective entries in each row and in each column is all substantially equal to zero. The technique inversely transforms the image data, which is obtained by the transformation with the adjusted color signal transformation matrix, into the image data in the RGB colorimetric system by means of an inverse color signal transformation matrix. The inversely transformed image has the numerical value of real number x embedded therein as the digital watermark. The numerical value of real number x is decoded from transformed image data, which is obtained by transforming the original image into color signals in the YCbCr colorimetric system.